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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20040311

Application Number: 09/916,122
Filing Date: July 26, 2001
Appellant(s): FRIDDLE ET AL.

David W. Hibler
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 29 December 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is deficient because the human polynucleotide and human G protein-coupled receptor that are the subjects of the instant invention are not "novel", as stated in the brief. They are naturally occurring compounds. The novel aspect of the instant invention is the provision of an "isolated" nucleic acid encoding the naturally occurring protein that is described in the instant specification.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1 to 5 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

No prior art is relied upon by the examiner in the rejection of the claims under appeal.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 to 5 are rejected under 35 U.S.C. § 101 because they are drawn to an invention with no apparent or disclosed specific and substantial credible utility. The instant application has provided a description of an isolated DNA encoding a protein and the protein encoded thereby. The instant application does not disclose a specific biological role for this DNA or the protein encoded thereby or their significance to a particular disease, disorder or physiological process for which they are diagnostic or which one would wish to manipulate for a desired clinical effect.

It is clear from the instant specification that the receptor protein encoded by the isolated nucleic acid described therein is what is termed an "orphan receptor" in the art. This is a protein whose cDNA has been isolated because of its similarity to known proteins. There is little doubt that, after complete characterization, this protein and an isolated nucleic acid encoding it may be found to have a specific and substantial

credible utility. This further characterization, however, is part of the act of invention and until it has been undertaken Appellant's claimed invention is incomplete. Whereas one could readily employ a putative receptor protein encoded by an isolated nucleic acid molecule of the instant invention in an assay to identify ligands thereto, the information obtained thereby would be of little use until one discovers the identity of those physiological processes moderated by that putative receptor. Because the instant specification has failed to identify a physiological process which has been shown to be influenced by the activation or inhibition of a putative receptor protein of the instant invention, an artisan would have no way of predicting what effects the administration of that ligand to an organism would have. If one can not predict the effects that the administration of a ligand of the putative receptor of the instant invention is going to have on an organism, then it is unclear as to what practical benefit is derived by the public from the identification of that ligand.

The instant situation is directly analogous to that which was addressed in *Brenner v. Manson*, 148 U.S.P.Q. 689 (Sus. Ct, 1966), in which a novel compound which was structurally analogous to other compounds which were known to possess anti-cancer activity was alleged to be potentially useful as an anti-tumor agent in the absence of evidence supporting this utility. The court expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation. However, the court held that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. ' 101, which requires that an

invention must have either an immediately obvious or fully disclosed "real world" utility. The court held that:

> "The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility", " [u]nless and until a process is refined and developed to this point-where specific benefit exists in currently available form-there is insufficient justification for permitting an applicant to engross what may prove to be a broad field", and "a patent is not a hunting license", " [i]t is not a reward for the search, but compensation for its successful conclusion."

The instant claims are drawn to an isolated nucleic acid molecule which is defined solely by the protein encoded thereby and which protein is of as yet undetermined function or biological significance. There is absolutely no evidence of record or any line of reasoning that would support a conclusion that a protein encoded by an isolated nucleic acid molecule of the instant invention is associated in any way with a particular mental, biological or medical disorder or disease. Until some actual and specific significance can be attributed to the protein identified in the specification as "NGPCR", or the gene encoding it, the instant invention is incomplete.

The protein encoded by a DNA of the instant invention is a compound known to be structurally analogous to proteins which are known in the art as G protein-coupled receptors. As such, it belongs to a family of proteins of which some members are the targets of over 350 therapeutic agents currently on the market. However, each clinical agent which has been developed by measuring its interaction with a specific G protein-coupled receptor was evaluated against a receptor whose native ligand and physiological function were known, such as the adrenergic receptors, the dopamine

receptors and the serotonin receptors. There are also numerous G protein-coupled receptors which do not mediate clinically significant process. More importantly, an artisan knew, before they employed a specific G protein-coupled receptor to identify clinically useful compounds, which physiological process or processes they wished to manipulate and that the protein employed in their assay had an influence of that process. Even if one identifies an agonist or antagonist for a receptor of the instant invention, this information is useless since one has no idea of what clinical effect the administration of that agonist or antagonist to an individual would have. Therefore, in the absence of a knowledge of the natural ligands or biological significance of the protein encoded by the claimed nucleic acid, there is no immediately obvious patentable use for it or an isolated nucleic acid encoding it. To employ a protein of the instant invention in the identification of substances which inhibit or induce its activity is clearly to use it as the object of further research which has been determined by the courts to be a utility which, alone, does not support patentability. Since the instant specification does not disclose a specific and substantial "real world" use for NGPCR then the claimed invention is incomplete and, therefore, does not meet the requirements of 35 U.S.C. § 101 as being useful.

Claims 1 to 5 are rejected under 35 U.S.C. § 112, first paragraph, as failing to adequately teach how to use the instant invention for those reasons given above with regard to the rejection of these claims under 35 U.S.C. § 101.

(11) Response to Argument

Appellant has essentially traversed the rejection of claims 1 to 5 under 35 U.S.C. § 101 for lack of a **specific and substantial** credible utility on the premise that, because the instant specification describes polymorphisms of the claimed nucleic acid, it has utility in "diagnostic assays such as "forensic analysis", in "mapping a unique gene to a particular chromosome" or in a "gene chip". The employment of a nucleic acid of the instant invention in forensic analysis, chromosomal mapping or as a component in a gene chip is not a **specific** and **substantial** utility. It is well known in the art of molecular biology that the nucleotide sequences encoding an amino acid sequence of any particular protein will have inconsequential differences from individual to individual, as will the amino acid sequence encoded thereby. This is why all humans are not identical and why DNA fingerprinting works. Therefore, almost any cDNA can be employed as a forensic marker in some capacity, just as all cDNAs can be used as chromosomal or tissue markers or in a gene chip for expression profiling. These do not constitute **specific** and **substantial** utilities for the claimed nucleic acid. A specific forensic marker or gene chip component would be one which provided precise information about the individual from which a sample under analysis was taken, just as a specific chromosomal marker is one which is only associated with the presence of a specific disease, disorder or a distinguishing physical or physiological trait. Forensic markers in general, however, are only useful in the identification of the individual from which a sample originated through DNA fingerprinting, and provides no useful information about that individual beyond identification. Such utilities are not specific and **substantial**, and are analogous to the assertion that a particular protein can be

employed as a molecular weight marker, which is a specific utility because not all proteins have the same molecular weight but it is not a substantial utility because it does not relate to the novel aspects of that protein.

One could just as readily argue that any purified compound having a known structure could be employed as an analytical standard in such processes as nuclear magnetic resonance (NMR), infrared spectroscopy (IR), and mass spectroscopy as well as in polyacrylamide gel electrophoresis (PAGE), high performance liquid chromatography (HPLC) and gas chromatography. None of these processes could be practiced without either calibration standards having known molecular structures or, at least, a range of molecular weight markers having known molecular weights. One could further extrapolate upon this premise by asserting that any item having a fixed measurable parameter can be employed to calibrate any machine or process which measures that parameter. For example, any item having a constant mass within an acceptable range can be employed to calibrate a produce scale in a grocery store. The calibration of produce scales is certainly an important function since most states require produce scales to be calibrated and certified. Therefore, to accept Appellant's arguments that any nucleic acid encoding any protein of human origin is useful as a forensic marker would be comparable to conceding that any object of fixed mass has *prima facie* utility as a weight standard, irrespective of any other properties possessed by that object. It was just such applications that the court appeared to be referring to when it expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation (*Brenner v. Manson*, 148

U.S.P.Q. 689 (Sus. Ct, 1966)). Because the steroid compound which was the subject of that decision had a known structure and molecular weight, it could have readily been employed as a molecular standard at that time. Further, because that compound was a hydrocarbon, it certainly could have been employed in the well known process of combustion for purposes of lighting and/ or the generation of heat. The generation of heat by combustion of hydrocarbons certainly was and remains an important process. And, in contrast to Appellant's arguments, one can not use "a metal block, an automobile, or an elephant" as a molecular weight standard or as a fuel source. Irrespective of such obvious utilities, the court still held that the compound produced by the process at issue in *Brenner v. Manson* did not have a specific and substantial utility.

To grant Appellant a patent encompassing an isolated polynucleotide encoding a naturally occurring human protein of as yet undetermined biological significance would be to grant Applicant a monopoly "the metes and bounds" of which "are not capable of precise delineation". That monopoly "may engross a vast, unknown, and perhaps unknowable area" and "confer power to block off whole areas of scientific development, without compensating benefit to the public" *(Brenner v. Manson, Ibid)*. To grant Appellant a patent on the claimed polynucleotide based solely upon an assertion that it can be employed as a forensic or chromosomal marker, or as one of many indistinct components in a gene chip is clearly prohibited by this judicial precedent since the compensation to the public is not commensurate with the monopoly granted and would be no different than granting a patent on the process disputed in *Brenner v. Manson* on

the premise that the steroid produced thereby was useful as an analytical standard or as a combustible fuel source.

Appellant urges that the instant rejection is in direct conflict with the decision in *Carl Zeiss Stiftung v. Renishaw PLC*, 20 USPQ2d 1101 (Fed. Cir. 1991; "carl Zeiss"). That decision held that a component of a mechanical device had specific and substantial utility because "[I]t mounts the probe, and it does so in a yielding manner so that it will not injure the object, or itself, by excessive pressure". This decision is absolutely silent on the utility requirements for proteins, nucleic acids or chemical compounds and compositions in general. The instant rejection is based upon the guidance provided by the REVISED INTERIM UTILITY GUIDELINES TRAINING MATERIALS (http://ptoweb.uspto.gov/patents/filecab/documents/Utility.pdf - 188.0KB, 28 Feb. 2000), which reflect the policies of the U.S.P.T.O. on the subject of utility with respect to recombinant nucleic acids like that of the instant invention. Those guidelines were most certainly formulated with full knowledge of all judicial precedents applicable thereto.

Appellant urges that "the presently described polymorphisms are part of a family of polymorphisms that have a well established utility". Appellant does not identify any reference of record that describes "a family of polymorphisms that have a well established utility" nor does Appellant accept the fact that a well established utility is not necessarily a well established specific and substantial utility. The employment of any hydrocarbon as fuel for combustion is certainly a well established utility but it is not

necessarily a specific and substantial utility for a particular compound simply because that compound is a hydrocarbon.

Appellant's reliance on *In re Brana*, 51 F.3d 1560,1566, 34 USPQ2d 1436 ,1441 (Fed. Cir. 1995) is misplaced. That court decision determined that a compound which belonged to a family of compounds known to have anti-tumor activity, which is a common and well established specific and substantial utility for that family of compounds, would be reasonably expected to have anti-tumor activity in light of positive *in vitro* data with respect to that particular compound since that data has proven to be an indicator of anti-cancer activity by other members of that family. The protein of the instant invention does not belong to a family of compounds with a **common** well established specific and **substantial** utility. The utility of those members of the receptor family to which the protein encoded by the claimed nucleic acid in the instant application belongs lies in the knowledge that they modulate a specific physiological activity in response to a specific ligand. Since the instant specification does not disclose the identity of a native ligand for the protein of the instant invention, simply knowing that a protein of the instant invention is a member of the G protein-coupled receptor family is not particularly useful. Further, it is a matter of law that an invention must have a specific and substantial practical utility "in currently available form" *(Brenner v. Manson*, 148 U.S.P.Q. 689 (Sus. Ct, 1966)). This holding precludes the need for further experimentation for the purpose of identifying a specific utility for a claimed invention. A patent is granted for an invention which provides an immediate solution to a specific problem. A nucleic acid molecule of the instant invention lacks a practical utility in

currently available form because it is a potential solution to a problem which has yet to be recognized.

Appellant urges that the presence of an amino acid sequence corresponding to that recited in the instant claims in the GenBank database somehow demonstrates a specific and substantial utility for the claimed polynucleotide. The simple description of the structure of a chemical compound in a public forum does not automatically convey upon that compound a specific and substantial utility. There are literally thousands of amino acid sequences corresponding to naturally occurring proteins in the public databases which currently lack a specific and substantial utility. An odorant (olfactory) receptor for which a respective odorant has yet to be identified would be included in those compounds lacking a specific and substantial utility in currently available form.

Appellant further traverses this rejection on the premise that membership in the G protein-coupled receptor family is, alone, sufficient to establish a utility for a specific protein and, therefore, the claimed nucleic acid. Appellant asserts that a protein of the instant invention belongs to a family of proteins which are the targets of 60% of the therapeutic agents currently on the market. This number is probably higher since a number of agents, such as antidepressants and hypertension medications, were being employed clinically before their site of action was known. However, each clinical agent which has been developed by measuring its interaction with a specific G protein-coupled receptor was evaluated against a receptor whose native ligand and physiological function were known, such as the adrenergic receptors, the dopamine receptors and the serotonin receptors. There are also numerous G protein-coupled

receptors such as odorant receptors and calcium sensing receptors which do not appear to mediate any clinically significant process. More importantly, an artisan knew, before they employed a specific G protein-coupled receptor to identify clinically useful compounds, which physiological process or processes they wished to manipulate and that the protein employed in their assay had an influence of that process. Even if one identifies an agonist or antagonist for a receptor of the instant invention by employing a cell comprising the claimed nucleic acid, this information is useless since one has no idea of what clinical effect the administration of that agonist or antagonist to an individual would have.

Appellant has cited several patents in support of the assertion that gene chips have utility. The practical utility of gene chips as research tools is not in dispute. Therefore, Appellant's reliance on issued patents in establishing the usefulness of gene chips is unnecessary. The introduction of references to support a position that is not in dispute is pointless.

Second, one of ordinary skill would reasonably believe that a gene chip which has been constructed for the purpose of monitoring human gene expression in response to outside stimuli would have the greatest utility if it contained cDNAs corresponding to all of the gene products produced by a human being. Therefore, a human gene chip containing a cDNA encoding a protein of the instant invention would certainly be incrementally more useful than one lacking such a cDNA. This, of course, would be true for all cDNAs encoding proteins of human origin and, therefore, the inclusion of the claimed polynucleotide in such an application does not constitute a

specific and substantial utility for that polynucleotide. Further, the gene chip argument is not applicable to claims 1, 2 and 5 because these claims are not limited to polynucleotides having sequences corresponding to those that are found in a human or in nature.

It is noted that gene chip containing are tools that have utility in the scientific community. Irrespective of Appellant's lengthy arguments, this issue is not in dispute. It is further noted that cDNA libraries, nucleic acid vectors, recombinant host cells, and methods of producing proteins, specifically G protein-coupled receptors, recombinantly are all inventions that have substantial utility in the scientific community. It is further conceded that a human cDNA library or a human cDNA gene chip containing is most useful when the members contained therein represent the most comprehensive collection of different human gene products. However, Appellant did not invent cDNA gene chip, cDNA libraries, nucleic acid vectors, recombinant host cells, and methods of producing proteins, and specifically G protein-coupled receptors, recombinantly.
As stated above, It has been conceded that a human cDNA library or a human gene chip is most useful when the members contained therein represent the most comprehensive collection of different human gene products. Therefore, the addition of any human cDNA to a human cDNA library or a human gene chip which does not already contain that cDNA increases the usefulness of that collection of cDNAs. A specific utility, however, is one that is based upon **the novel aspects of Appellant's invention**, which, in the instant application, is an isolated polynucleotide encoding at least 20 amino acids from the amino acid sequence presented in SEQ ID NO:2. The

particulars of employing a gene chip containing SEQ ID NO:2 are not disclosed in the instant specification. The instant cDNA is has not been demonstrated to be a specific target for therapeutic drugs nor has it been shown to be associated in any way with a particular disease or disorder. In fact, there is no evidence of record that any odorant receptor is the target of a specific therapeutic compound or has been shown to be associated with a particular disease or disorder. Therefore, the utility of including a nucleic acid of the instant invention in a gene chip would apply to virtually every member of a general class of materials, such as any collection of proteins or DNA, but is only potential with respect to SEQ ID NO:1. Because of this, such a utility is not specific and does not constitute a "well-established" utility. Further, because any potential diagnostic utility is not yet known and has not yet been disclosed for SEQ ID NO:1, the utility is not substantial because it is not currently available in practical form. Moreover, use of the claimed polynucleotide in an array for diagnosis or assessing gene expression is only useful in the sense that the information that is gained from the array is dependent on the pattern derived from the array, and says nothing with regard to each individual member of the array. Again, this is a utility which would apply to virtually ever member of a general class of materials, such as any collection of proteins or DNA. Even if the expression of Appellant's individual polynucleotide is affected by a test compound in a gene chip that is being employed for drug screening, the specification does not disclose any specific and substantial interpretation for the result, and none is known in the art. The claimed polynucleotide lacks a **specific** and substantial utility in currently available form because the specification does not disclose a particular and

specific advantage to be realized by the addition of the claimed polynucleotide to a gene chip as opposed to the addition of any other human cDNA which might be lacking therefrom.

Appellant's reference to issued patents as establishing a patentable utility for the claimed nucleic acid is not persuasive because each application is examined on its own merits. In the decision of *In re Hutchison*, 69 USPQ 138 (CCPA, 1946), the court held that

> "We are not concerned, of course, with the allowed claims in either the patent or in this application. The sole question for our determination is whether the six article claims on appeal were properly rejected below, and this we pass upon without further reference to, and without comparing them with, the claims in the patent or the claims which stand allowed in this application."

In essence, the position in the instant application that each application is examined on its own merits can be found in the judicial precedent cited above. The rejections in the instant application will only be withdrawn if they are shown to be legally or factually unsound.

Appellant's arguments that the "Utility Guidelines set forth by the USPTO" are inconsistent with 35 U.S.C. and 37 C.F.R. will not be answered. The contents of 35 U.S.C., 37 C.F.R., judicial decisions, and guidelines established by the USPTO are not subject to examiner review and will not be questioned or defended by the examiner. These are decisions made by legally empowered government entities to which the examiner is subordinate and those decisions will be followed without question by the examining corps.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

March 22, 2004

Conferees

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